



Public Workshop: Next Generation Retrofits for Multi-family Buildings

Tuesday, December 11, 2018

8:00 am – 4:30 pm PST

California Department of Food and Agriculture

1220 N Street

1st Floor, Auditorium

Sacramento, CA 95814

Workshop Agenda

Workshop Goals

- Provide information on innovative, cost-effective approaches to implementing deep energy retrofits for multi-family buildings with a focus on next generation envelope retrofits and advanced, high efficiency HVAC and hot water retrofit technologies.
- Identify challenges to developing affordable, fast-deployment, and minimally invasive solutions.
- Identify and prioritize R&D opportunities for scalable deep energy retrofits.
- Seek public input and feedback on framework and mechanisms to enable rapid development of innovative solutions and implementation at the local level.

Building Envelope Goals	HVAC and Water Heating Goals
<ul style="list-style-type: none">○ Envelope retrofit solutions that can be mass produced and applied to existing facades○ Non-invasive solutions with minimal disruption to building occupants and owners○ Use of automation technologies, such as robotics for advanced manufacturing and rapid onsite construction / assembly to improve performance, speed of delivery and reduce costs○ Leverage opportunities for digital design and fabrication of the building facade (e.g., 3D printing, building information modeling)	<ul style="list-style-type: none">○ High efficiency mechanical retrofits (HVAC and water heating and controls) to be installed with minimal disruption and changes to existing ventilation and other systems○ Leverage opportunities for digital design and advanced computing and communication to enable custom manufacturing (i.e., low-load HVAC system designed for a particular existing building)

8:00 Sign In

8:30 Welcome & Review Workshop Goals, California Energy Commission & U.S. Department of Energy

8:45 California Multifamily Building Stock and Current Retrofit Status

- Eugene Lee, California Energy Commission
- Andy Brooks, Association for Energy Affordability

9:15 Cutting-edge Approaches

- RetrofitNY and Energiesprong (TBD)
- Industry Innovations (TBD)

9:45 Introduction to Morning Breakout Session & Break

10:00 Morning Breakout Session: Retrofit Technologies and Approaches

(Divide into Envelope and HVAC groups – see notation on name tag)

Part 1: Technology Breakthroughs to Enable Cutting Edge Approaches (30 min)

In order to scale deep energy retrofits of existing buildings, new integrated “leap-frog” solutions are needed. This discussion will focus on envisioning the types of outcomes and breakthroughs (e.g., mass production automation, digital fabrication, new delivery mechanisms) needed to scale deep energy retrofits of existing buildings.

Part 2: Technology Challenges (30 min)

Some innovative solutions have been tested and demonstrated to be technically feasible and appealing to building occupants outside of the United States. This discussion will explore the potential of introducing these or other “leap-frog” approaches in the United States and identify technical challenges and barriers to successful implementation.

Part 3: R&D Solutions (45 min)

This discussion will focus on identifying the types of innovation and research needed to overcome technical challenges and barriers.

11:45 Prioritization Exercise

12:00 Report Outs from Morning Session

12:30 Lunch (please return no later than 1:30 for prompt start)

1:30 Afternoon Breakout Session: Strategic Approaches to Innovation

(Divided into two groups -- see notation on name tag)

Part 1: Phased Approach to R&D (40 min)

Given the uncertainty associated with novel technologies, a phased approach to R&D may be advisable. This session will explore what is possible to achieve in one, three, and five-year research increments and discuss methods for evaluating each phase. The discussion will also consider what timelines are realistic for moving from research, to prototype, to demonstration and ultimately to scaled applications.

Part 2: Building Types and Geographies (40 min)

Several factors are likely important in helping “leap-frog” technologies succeed broadly in the market. This discussion will identify which factors are most important to consider when determining most viable R&D paths for investment, including the vintage and location of buildings, climate zones and associated heating/cooling requirements, and type of building ownership.

Part 3: Cross-Industry Teams (40 min)

In order to leverage advances in computing, automation, and other innovations, cross cutting teams are likely needed to develop scalable retrofit solutions. This session will identify what partner types are likely critical to success (e.g., construction industry experts, research institutions, venture capital, advanced automation experts, building portfolio owners).

3:30 Prioritization Exercise (where applicable) & Break

3:45 Report Outs from Afternoon Session

4:10 Next Steps for Research, Public Comment and Closing Remarks

4:30 Adjourn